REMOTE DISPLAY

HARDWARE HIGH LEVEL DESIGN
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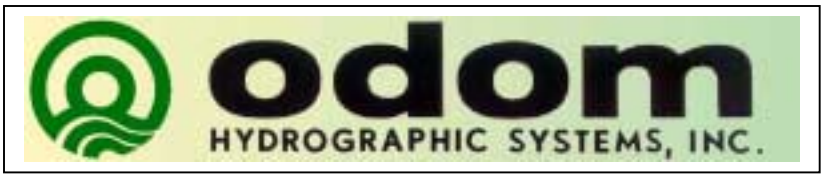

Revision History

Version	Date	Author	Remarks
1.0	11-19-2004	C. Myer	Initial version – draft

Approved

By:	Function	Signature	Date
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1 INTRODUCTION

The Remote Display is a single 4 x 20 LCD used to display depth information from the Echotrac series of echo sounders. The depth information is displayed in the same units as the echo sounder, where one decimal place represents feet and two decimal places represent meters. It is contained in a metal housing installed on a swivel mounting bracket. There is one DB9 connector mounted on the back, which supplies power and the serial data from the sounder.

1.1 Purpose

The purpose of this document is to describe the features and operation of the Echotrac MKIII or the Deso 30 Remote Display.

1.2 Scope

The content of this document is focused on the user.

1.3 Glossary

N/A

1.4 References

N/A

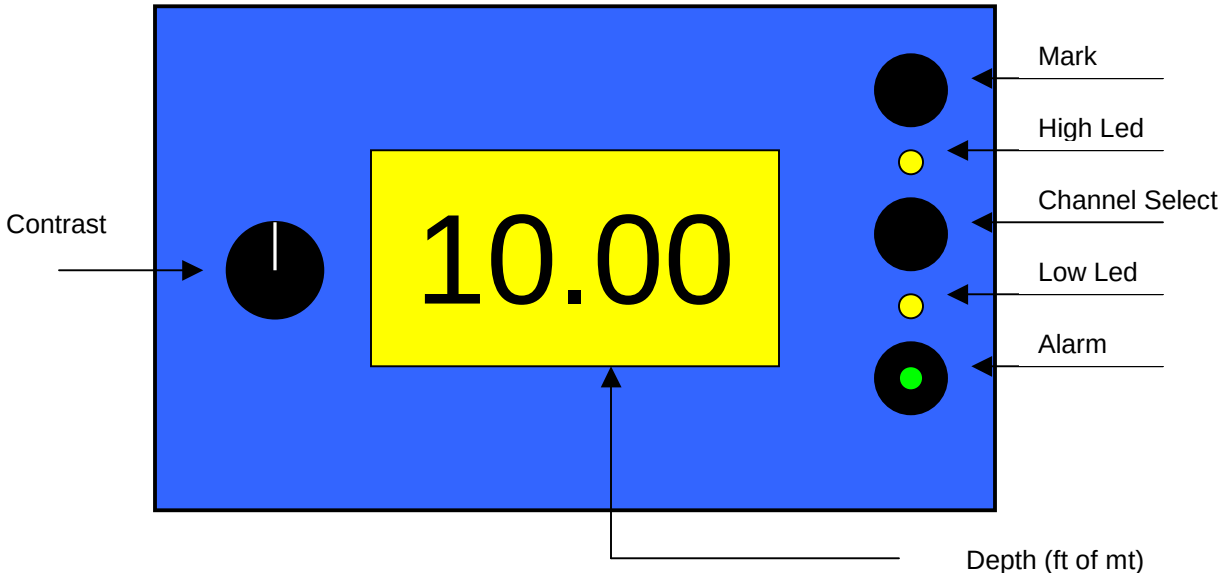
2 PRODUCT DESCRIPTION

2.1 Specifications

Model Number
RDU-2004
Display
4x20 Dot matrix Character LCD Module.
Resolution
0.01 Meters, 0.1 Feet
Power Requirements
24V supplied by the echo sounder through the standard serial cable (pin #8)
Weight
0.765 kg (1.6875 lb.)
Dimensions
Width 5.08cm (2") X Length 22.86cm (9") X Height 14.35cm (5.65")
Mounting
Swivel bracket for a Bulkhead installation
Ports/Interface
RS422 (depth data; operating power 24V; connect to COM2 of the echo sounder)
Features
LCD Brightness
Channel Select (dependent on mode of echo sounder: Single High Bathymetry, Single Low Bathymetry, Dual Bathymetry)
Alarm on/off (audible)
Mark (Used to fix mark the echo sounder chart)

2.2 Product Functions

This product is used to give the boat operator to remote view the echo sounder's depth data. The following is a picture representing the unit and its functions.

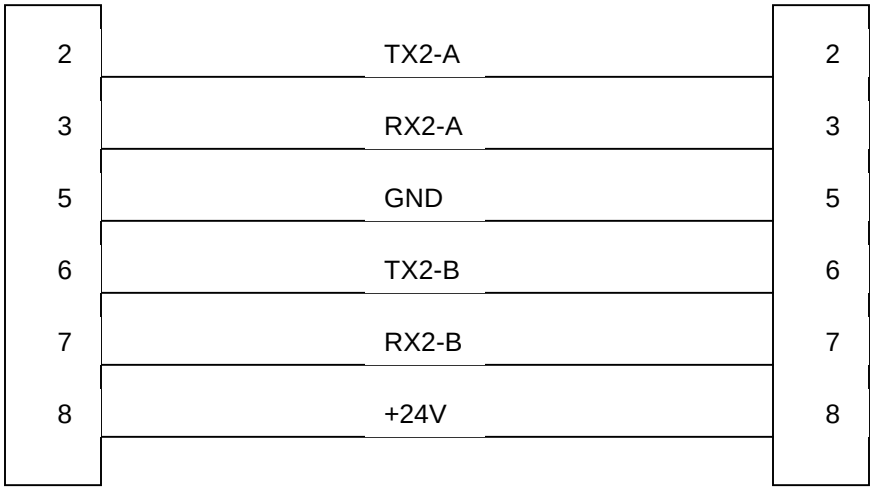


The unit functions work as follows:

- **Contrast:** The contrast knob controls the brightness of the Display.
- **Mark:** The mark button allows the operator to mark the echo sounder printer, when the printer is running. This can be used to mark an event of some kind such as a M.O.B marker (man over board).
- **Channel:** The channel select button allows the operator to select between Dual, Low, and High depths when the echo sounder is set in dual frequency operation. Please note that if the echo sounder is in a single frequency mode that the channel select button will have no effect and the appropriate Led will be illuminated.
- **Low Led:** This led is illuminated when low frequency is displayed.
- **High Led:** This led is illuminated when the high frequency is displayed.
- **Alarm:** When the alarm is on, the led in the middle of the button is on, the internal alarm will buzz when a echo is missed.
- **Depth Display:** The depth is displayed in the same units that the echo sounder. If there is one decimal place, the depth is in feet. If no decimal is present, the depth is in feet and greater then 1000ft. If there are two decimal places, then the depth units are meters. At greater then 1000mt, there is only one decimal.

2.3 Product Interfaces

The connection, between Communications port number 2 on the back panel of the Echo sounder and the Remote Display, is made with a standard off the shelf DB9 serial cable. The pertinent signals are as follows.



2.4 Assumptions and Dependencies

Set communication port 2 to on and set the baud rate to 9600 (on the echo sounder). Power is supplied through this port so do not connect COM2, of the echo sounder, to any device other than the Remote Display.

2.5 Apportioning of Requirements

N/A

3 INSTALLATION

The unit comes mounted on a swivel bracket, designed for a bulkhead installation.

3.1 Echo Sounder configurations / Modifications

1. Set shunts for JP1 through JP4 to position 1-2 (current loop operation for COM2), on the 2416-0019-REVA board.
2. Install a jumper wire on the back of 2416-0019-REVA between J3/6 and J2/6.
3. Install a jumper wire on the Communications Interface Board 2416-0010-REVA , between J1/6 (on the back of the board) to Pin 8 of COM2 (on the front of the board). Run the jumper wire through the left mounting hole of J1.
   Note: The purpose of the jumper wires on both boards is to put 24V on pin 8 of COM2 to power the Remote Display.

3.2 Connections

Connect the Remote Display to Communications Port 2 on the back of the MKIII or the Deso 30.

3.2.1 Powering Up the Equipment

The remote display will only power up when the echo sounder is turned on. It will only receive depth data when the unit is running.

3.2.2 Component configurations

N/A

3.2.3 Performance Requirements

N/A

3.2.4 Design constraints

N/A

3.2.5 Bill of Materials

#	QTY	PART REFERANCE #	Value			ODOM PART#	
1	10	C1,C3,C4,C5,C6,C7,C8,C9,C12,C13	0.1uf	SMT	0805	2710-0104-1000	
2	1	C2	4.7uf/16v	SMT	1206	2710-0475-1316	
3	2	C10,C11	100uf	SMT		2710-0107-1100	
4	2	C14,C15	470uf	THU		1110-0477-1910	
4	3	J1,J4,J6	3PIN RIGHT ANGLE HEADER	THU		0610-0049-0000	
5	1	J2	16 PIN HEADER SINGLE ROW HEADER	THU		0610-0053-0000	
6	1	J3	8 PIN RIGHT ANGLE HEADER	THU		0610-0135-0000	
7	1	J5	6 PIN RIGHT ANGLE HEADER	THU		0610-0040-0000	
8	1	L1	100UH POWER INDUCTOR	SMT		3111-0003-0000	
9	1	Q1	BCX5616			1380-0010-0000	
10	2	R10,R1	100 OHM	SMT	0805	2712-1000-0001	
11	1	R3	8.25K	SMT	0805	2712-8251-0001	
12	3	R4,R5,R6	10K	SMT	0805	2712-1002-0001	
13	3	R7,R8,R9	200 OHM	SMT	0805	2712-2000-0001	
14	2	R12,R13	121 OHM	SMT	0805	2712-1210-0001	
15	1	RV1	100 OHM POT	THU		1113-0100-0008	
16	1	U1	PIC16F877	SMT		1400-0011-0000	
17	1	U1	PLCC44 SOCKET	THU		0613-0011-0000	
18	2	U2	MAX490	SMT	S08	2710-0225-1325	
19	1	J2	LCD Module			0200-0014-0000	
20	1	U3	16MHZ 1/2 SIZE CRYSTAL OSCILLATOR	SMT		1011-0013-0000	
21	1	U4	PT5101C	SMT		1252-0004-0000	

3.3 Quality issues

N/A

3.4 Troubleshooting

1. **No display:** Check to make sure the serial cable is properly attached to the back of the Remote Display and connected to communication port 2 on the back of the echo sounder. If the cable is connected correctly, open the echo sounder up and make sure the ribbon cable going to the COM interface board is connected. Use a multimeter to verify that there is 24V between pin 8 and 5 of the serial cable. If there is no voltage, check the fuse F1 on the top of the Com-ethernet board. You will need to remove the cover to see the fuse. If none of this solves the problem, **send the unit back**. If, however, 24V is present on the DB9, remove both sides of the Remote Display and verify the internal connections. If everything is connected properly and the Remote Display still doesn't power up, **send the unit back**.
2. **The Display comes on but remains in standby:** This would indicate that no serial data is being sent from the echo sounder. First, make sure that communication port 2 is set to **ON** in the echo sounder. Please note that the echo sounder defaults to communication port 2 turned **OFF**. Make sure the baud rate is set to 9600. If the remote still doesn't display data, check the cable connection, and the jumper configuration mentioned in the modifications notes **3.1**. Remove both sides of the Remote and verify the internal connections. If everything is connected properly and the unit still doesn't power up, **send the unit back**.

Electrical diagram